AMENDEMNT

To the Claims:

Please amend the claims as follows:

1. (currently amended) A method used by a hardware apparatus for determining a reference image block in direct coding mode, comprising the steps of:

(1) obtaining a motion vector in a backward reference frame of a B frame with respect to a current image block;

(2) obtaining a motion vector MV(x,y) for direct coding a current B frame image block in accordance with the obtained motion vector of a corresponding image block in the backward reference frame,

calculating a forward motion vector MV_F of the current block by using the following formulas:

assuming scale_factor = 2^{shift_len}, td = tp – tb;

if mv(i) < 0 :

$MV_F(i) = -(((scale\_factor / tp) \times (1 - mv(i) \times tb)-1) >> shift\_len)$

else,

$MV_F(i) = ((scale\_factor / tp) \times (1 + mv(i) \times tb)-1) >> shift\_len$ [[ ]]

calculating a ~~forward~~ backward motion vector MV_B of the current block by using the following formulas:

if mv(i) < 0 :

$MV_B(i) = ((scale\_factor / tp) \times (1 - mv(i) \times td)-1) >> shift\_len$

else,

$MV_B(i) = -(((scale\_factor / tp) \times (1 + mv(i) \times td)-1) >> shift\_len)$

where the scale_factor value is a decimal fraction amplification factor; the shift_len denotes times for right shift and shift_len is a natural number; MV_F and MV_B denote a forward motion vector and a backward motion vector corresponding to the current block; tb is a distance in time domain between a current picture and a forward reference picture; td denotes a distance in time domain between a forward reference picture and a backward reference picture; tp is a distance in time domain between a current picture and a backward reference picture; MV(i) denotes a horizontal component or vertical component of motion vector of the corresponding part of the backward reference picture with respect to a forward reference frame; MV(x,y)= (MV(x) , MV(y)) is a two-dimensional vector, of which the corresponding components are MV(x),MV(y); MV(i)denotes MV(x) or MV(y); and a/b denotes ~~integering~~ an integer of a quotient of a and b towards zero, a is the dividend of $MV_F(i)$ or $MV_B(i)$, b is the divisor of $MV_F(i)$ or $MV_B(i)$;

(3)the forward and backward image block pointed by the motion vector obtained from step (2) acting as a reference image block of the current image block.

2. (currently amended) The method used by the hardware apparatus for determining a reference image block in direct coding mode as claimed in claim 1, wherein in step (2), the following method can be used to obtain a motion vector MV(x,y) for direct coding a current B frame image block:

calculating a forward motion vector MV_F of the current block by using the following formulas:

assuming $scale\_factor = 2^{shift\_len}$,

if $mv(i) < 0$:

MV_F (i) = -(((scale_factor / tp) - (tb × scale_factor / tp) × mv(i)-1) >> shift_len)

else,

MV_F (i) = ((scale_factor / tp) + (tb × scale_factor / tp) × mv(i)-1) >> shift_len [[ ]])

calculating a backward motion vector MV_B of the current block by using the following formulas:

if mv(i) < 0 :

MV_B (i) = ((scale_factor / tp) – (td × scale_factor / tp)×mv(i)-1) >> shift_len

else,

MV_B (i) = - (((scale_factor / tp) + (td × scale_factor / tp)×mv(i)-1) >> shift_len)

where the scale_factor value is a decimal fraction amplification factor; the shift_len denotes times for right shift; MV_F and MV_B denote a forward motion vector and a backward motion vector corresponding to the current block; tb is a distance in time domain between a current picture and a forward reference picture; td denotes a distance in time domain between a forward reference picture and a backward reference picture; MV denotes a motion vector of the corresponding part of the backward reference picture with respect to a forward reference frame; MV(x,y)= (MV(x) , MV(y)) is two-dimensional vector, of which the corresponding components are MV(x),MV(y); MV(i)denotes MV(x) or MV(y); and a/b denotes integering a quotient of a and b towards zero.

3. (currently amended) The method <u>used by the hardware apparatus</u> for determining a reference image block in direct coding mode as claimed in claim 1, wherein in step (2), calculating a forward motion vector MV_F of the current block by using the following formulas:

assuming scale_factor = 2^{shift_len}, td = tp – tb;

if mv(i) < 0 :

MV_F (i) = - (((scale_factor / tp) × (1 - mv(i) × tb)) >> shift_len)

else,

MV_F (i) = ((scale_factor / tp) × (1 + mv(i) × tb)) >> shift_len)

calculating a backward motion vector MV_B of the current block by using the following formulas:

if mv(i) < 0 :

MV_B (i) = ((scale_factor / tp) × (1 - mv(i) × td)) >> shift_len

else,

MV_B (i) = -(((scale_factor / tp) × (1 + mv(i) × td)) >> shift_len).

4. (currently amended) The method used by the hardware apparatus for determining a reference image block in direct coding mode as claimed in claim 1, wherein in step (2),

calculating a forward motion vector MV_F of the current block by using the following formulas:

assuming scale_factor = 2^{shift_len},

if mv(i) < 0 :

MV_F (i) = -(((scale_factor / tp) - (tb × scale_factor / tp) × mv(i)) >> shift_len);

or else,

MV_F (i) = ((scale_factor / tp) + (tb × scale_factor / tp) × mv(i)) >> shift_len;

calculating a backward motion vector MV_B of the current block by using the following formulas:

if mv(i) < 0 :

MV_B (i) = ((scale_factor / tp) – (td × scale_factor / tp)×mv(i)) >> shift_len;

or else,

MV_B (i) = - (((scale_factor / tp) + (td × scale_factor / tp)×mv(i)) >> shift_len).

5. (currently amended) The method used by the hardware apparatus for determining a reference image block in direct coding mode as claimed in claim 2, wherein scale_factor / tp [[ ]] , tb × scale_factor / tp [[ ]] , td / tp × scale_factor parameters are pre-calculated prior to the step (1), and a calculated result is stored in a table, which is directly picked up by the calculation in step (2).

6. (currently amended) The method used by the hardware apparatus for determining a reference image block in direct coding mode as claimed in claim 1, wherein said shift_len in step (2) is a natural number larger than or equal to 8.

7. (currently amended) The method used by the hardware apparatus for determining a reference image block in direct coding mode as claimed in claim 1, wherein said obtaining a motion vector of the corresponding block of the backward reference frame comprises:

selecting a macro block in a backward reference P frame with the same position as a macro block to be coded in B frame as a corresponding macro block, and obtaining a motion vector of the macro block of the P frame.